(No Model.) 2 Sheets—Sheet 1.

E. B. POWERS.

BLOW PIPE.

No. 395,453. Patented Jan. 1, 1889.

Fig. 1.

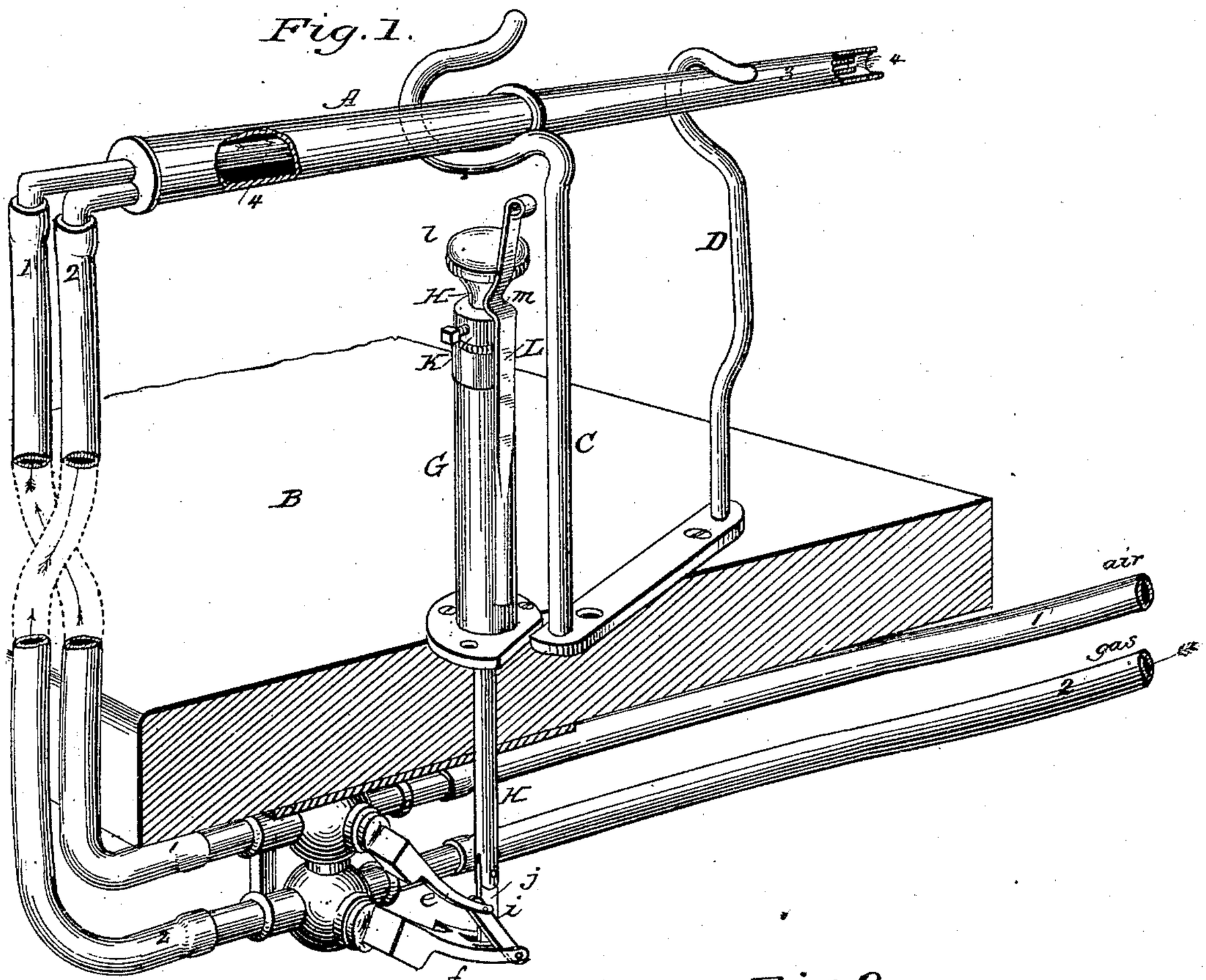
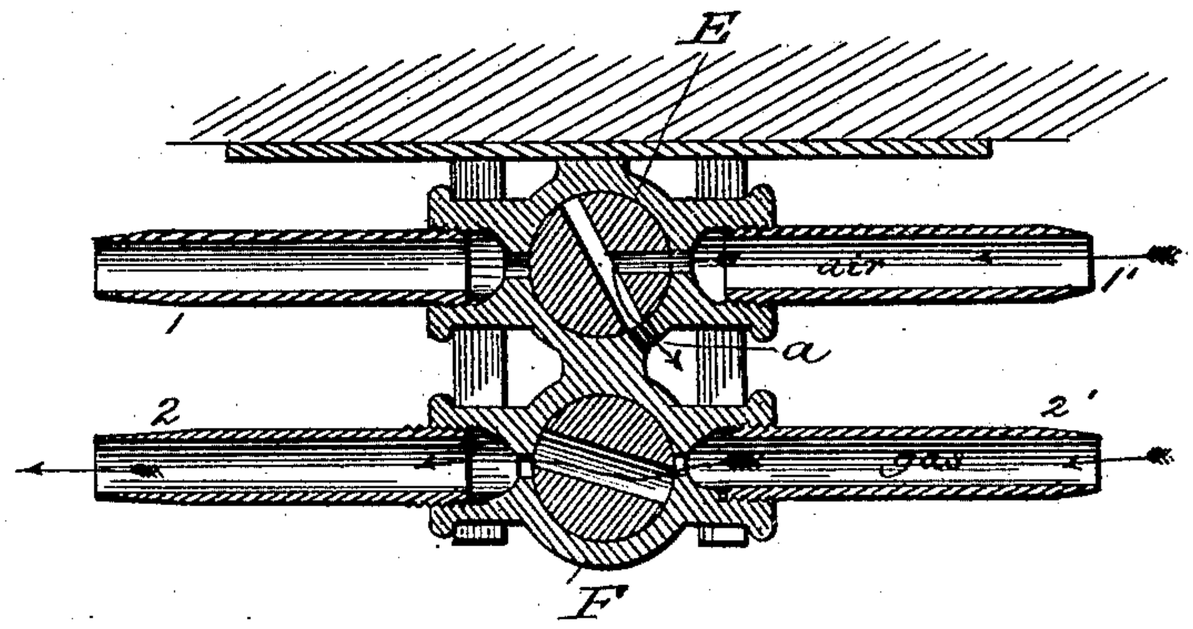


Fig. 2



WITNESSES:
Fred G. Dieterich
Amos W. Hart.

INVENTOR:
E. B. Powers
BY Munn & Co
ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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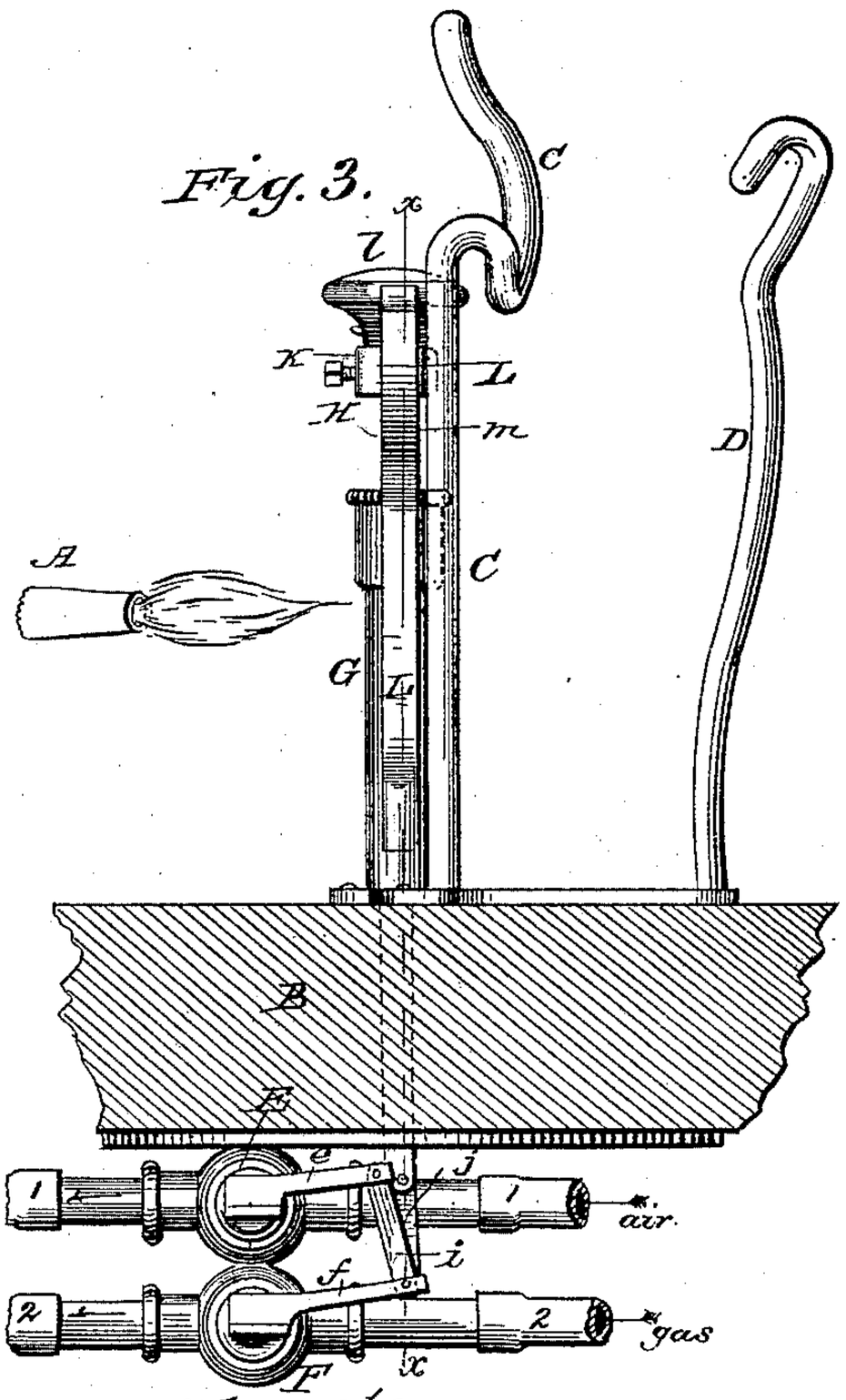
Fig. 3.



valves open

Fig. 4.

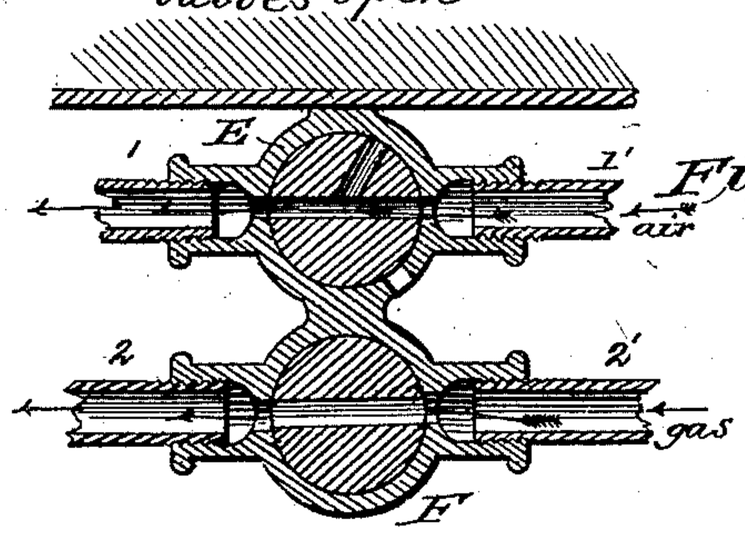


Fig. 5.

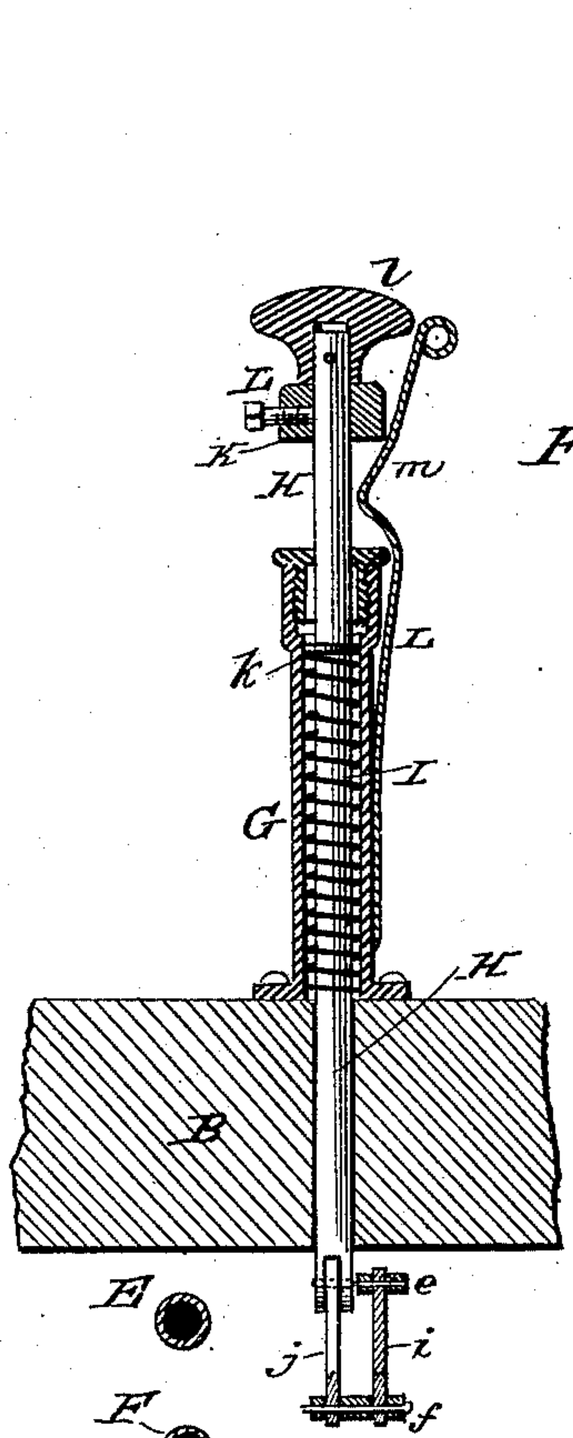
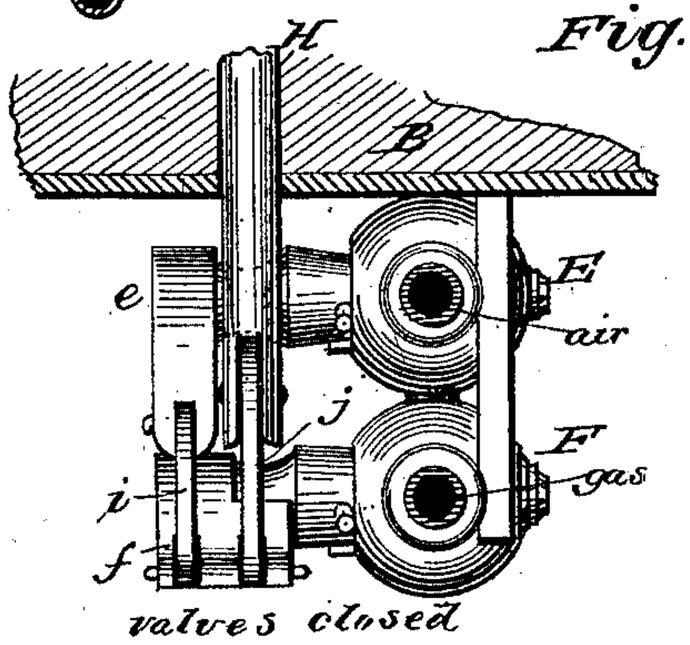


Fig. 6.



valves closed

WITNESSES:

Fred G. Dieterich

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INVENTOR:

E. B. Powers

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

EDWARD B. POWERS, OF TAUNTON, MASSACHUSETTS, ASSIGNOR TO REED & BARTON, OF SAME PLACE.

BLOW-PIPE.

SPECIFICATION forming part of Letters Patent No. 395,453, dated January 1, 1889.

Application filed March 6, 1888. Serial No. 266,359. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. POWERS, of Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Blow-Pipes, of which the following is a specification.

This invention is an improvement in that class of blow-pipe apparatus used by jewelers, tinsmiths, and certain other metal-workers, in which a gas-jet and air-blast are employed to produce the flame required for soldering or brazing.

To aid in defining the scope of my invention I will briefly indicate the state of the art. Air and gas blow-pipes proper have long been used, and the tubes or pipes conveying the air and gas have been provided with one valve each, operated by hand. In actual operation different kinds of work require a different-sized flame, which is obtained by opening or closing more or less the valves above referred to; but a workman having adjusted the flame to the size wanted for a given job has then no occasion to change the position of these valves, except when he lays aside his blow-pipe to adjust the piece he is working upon, or when he lays it aside by reason of his attention being called away from his work. In such cases, unless he takes the trouble to turn off the gas to the least flow necessary to keep the light from going out, and also turns the air-valve to reduce the current of air in order to prevent the blowing out of the reduced flame, a great loss of gas is involved, and when he resumes work there is loss from the trouble to again adjust these hand-valves. As an improvement it has also been proposed to employ an automatic cut-off for the gas and air pipes, and the same has been embodied in a valve attachment for the blow-pipe proper, the valve having a spring-actuated lever-arm projecting from its side, and which, when the blow-pipe is placed in a certain position on a fixed rest or support specially adapted for the purpose, is caused to close the valve and thus check the air and gas currents. Upon again taking up the blow-pipe for use the valve opens automatically, and thus the said currents are re-established.

This improvement is open to the objections that the lever-arm and spring attached to the side of the blow-pipe are serious hinderances to deft and convenient manipulation of the implement, and especial care is required in placing the blow-pipe in its support and adjusting it exactly in the position necessary to close the valve.

In my apparatus I employ the ordinary blow-pipe and provide air and gas cut-off valves, which are operated by pressing upon a spring-supported rod, the head of the latter being located in such proximity and relation to the stand or support for the blow-pipe that it may be easily reached by the hand of the operator when taking up the blow-pipe or laying it down.

The invention likewise includes improvement in the air-valve and its connection with the gas-valve and operating-rod, and other features hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of the apparatus when not in use, the work-bench being in section; Fig. 2, a vertical longitudinal section of the valves in their closed position. Fig. 3 is a side elevation of the apparatus. Fig. 4 is a vertical section of the valves when open. Fig. 5 is a vertical section on line $x\,x$ of Fig. 3. Fig. 6 is a perspective view of the valve-lever mechanism in the position the same occupies when the valves are closed.

I will first indicate the main parts of the invention in the position they occupy when not in use, as in Fig. 1.

The blow-pipe A proper is shown supported above the work-bench B in horizontal position by a fixed vertical stand, C, and hook D, which are constructed of metal rods or bars—that is to say, the blow-pipe is fulcrumed as a lever in the bent upper end of the stand C, and its smaller end bears upward against the hook D, owing to the weight of the lever itself and the flexible tubes 1 2 pendent from it. It has the usual construction—that is to say, it consists of two metal tubes, an exterior gas-tube, 3, and interior air-tube, 4. Flexible air and gas conducting tubes 1 and 2 connect the blow-pipe with the cut-off valves E and F beneath the bench B, and other suitable

tubes, 1′ 2′, lead therefrom to air and gas supplying sources.

It now remains to describe the valves and valve-operating mechanism.

The air valve or cock is arranged above the gas-valve, both being in horizontal position and respectively provided with slotted lever-arms *e f*. The latter are connected by a link, *i*, so that both valves are operated together for admitting or cutting off air and gas. The means for operating the valves are as follows: A vertical tubular standard, G, is fixed on the work-bench B (see Figs. 1, 3, 5, and 6) beside and at the left of the stand C and just in front of its bent arm *c*. A rod, H, works vertically in this standard, and its lower end is connected by a pivoted link, *j*, with the arm *f* of the gas-valve F. A collar, *k*, Fig. 5, is fixed on the rod H within the standard G, and a spiral spring, I, encircles the portion of the rod between it and the base of the standard. The upward pressure of the spring I against this collar holds the valve-arms *e f* in horizontal position and the valves open. By pressing on the enlarged head *l* of the rod H the spring I is compressed and the parts assume the position shown in Figs. 1, 2, and 6, the air being cut off from blow-pipe A and so turned as to escape through outlet *a*, (shown in Fig. 2,) and the gas being nearly cut off. To hold or lock the rod down in this position, I employ collar K, secured adjustably on its upper portion, and a plate-spring, L, affixed to the standard G longitudinally and having its upper free portion bent inward at a point, *m*, just below its extremity, which is bent outward. The shoulder which is thus formed fulfills the office of a catch by engaging with the upper edge of the collar K, as shown in Fig. 1. It will be seen that the valve-rod H is located close to the stand C, its head being in front of the lateral bend of the latter.

One practical advantage obtained by the before-described local relation of the support-standard C to the tubular standard G is that it protects the spring L from being struck by the blow-pipe in handling the latter. Another advantage is that as the operator takes the blow-pipe from its rest C with either hand he strikes the projecting extremity of the spring L with one of the fingers of the same hand, preferably the third, thus disengaging the catch *m* from collar K and allowing the reaction of the spring I to raise the rod H and valve-arms *e f* to the position shown in Fig. 3, which opens valves, as already stated. Again, in replacing the blow-pipe on its rest the thumb of the operator's hand comes directly over the head *l* of the valve-rod H, and as the grasp on the blow-pipe is released the thumb is in position to press down on the rod, which brings the parts to the position shown in Fig. 1—that is to say, turns and locks the valves and cuts off the air entirely and diverts it to the escape-outlet *a* and cuts the gas down to the smallest practical burning-current.

I will detail the construction of the valves proper, whereby a certain novel and useful effect is attained in their operation.

The plug of the gas-valve F, Fig. 2, has a single transverse passage; but the plug is never turned far enough to completely shut off the gas-current. On the contrary, a very small opening is left, Fig. 2, to allow sufficient gas to pass to maintain a small flame at the end of the blow-pipe A, when not in use, so that the lamp never goes out so long as the operator has need of it. To entirely cut off the gas-current or to regulate the size of the working flame, a separate hand-operated valve (not shown) is employed, as usual heretofore, and the same for the air-current. The size of the opening thus maintained through the plug of the gas-valve, and the consequent size of the small igniting-flame, are regulated at will by adjustment of the collar K, which is movable on the valve-rod H. This collar has a clamp-screw for securing it at the desired point. When the rod H descends, the collar comes in contact with the top of the standard G, and thus serves as an adjustable stop or gage. As the collar K is placed lower or higher on the rod, it is obvious the gas-valve F will be closed more or less when the rod is pressed down. Instead of employing this collar the head or knob *l* of the rod H may be made vertically adjustable.

The air-valve E has a two-way plug, Fig. 2, it being provided with a transverse passage through it, and another of less length arranged at an angle to it and communicating with it. An opening is formed in the rear side of the casing of this valve, as shown in Fig. 2, (it may be on the other side as well,) so that when the plug is turned, Fig. 2, to entirely shut off the air-blast from the blow-pipe (when not in use) the air escapes through said opening in the manner shown by arrows.

To recapitulate and further explain the combined operation of the valves, I will state that when the rod H is released from the spring-catch *m*, and the parts are in the position shown in Figs. 3 or 4, the air and gas currents flow unimpeded through the respective valves, and a working-flame is produced at the mouth of the blow-pipe; but when the lamp is not required for use the rod is pressed down and locked, as shown in Figs. 1 or 2. The gas-current is thus nearly cut off, and the air-blast entirely so.

The function of the air outlet or escape *a* is important at this juncture, since it relieves the compression of the air which would otherwise occur in the tube, and thus prevents a puff or sudden increase in the force of the blast from either causing great irregularity of the blast and flame or from extinguishing the flame altogether. With such outlet for the blast, when the valve-operating rod H is released, the flame is not materially disturbed, but burns with the steadiness necessary for practical operation.

The air-valve E is made to turn faster and farther than the other one, F, and this result

is accomplished by reason of the difference in lengths of the valve-arms *e* and *f*, the gas-valve arm being the longer, so that it moves through a less arc than the other, which therefore turns the plug E farther. (See Figs. 1 and 2.) The same result might be accomplished by a differential relation in the size of the apertures in the plugs of the respective valves—that is to say, the gas-valve opening being made the larger; or the results might be accomplished by setting the air-plug ahead.

What I claim is—

1. In a soldering apparatus, the arrangement upon the work-bench B of the vertical standard C, having its upper end bent laterally to form a support for the blow-pipe, the vertically-sliding valve-rod H, and the guide G therefor, arranged close alongside and slightly in advance of said stand, as shown and described, whereby the head of the valve-rod is in front of the vertical bend of the stand, as shown, and for the purpose specified.

2. In a soldering apparatus, the combination, with a work-bench, a hollow standard secured vertically thereto, the blow-pipe, the air and gas tubes, and cut-off valves applied to said tubes, of a spring-supported rod arranged and adapted to slide within the said standard and connected with and operating the valves, and a catch which automatically engages the rod when the latter is depressed, and thereby holds the valves closed, as shown and described.

3. In a soldering apparatus of the class hereinbefore specified, the combination, with the blow-pipe, the air and gas tubes, valves for the latter, and a vertical guide, G, of the valve-rod working in said guide, a collar affixed to the valve-rod, and a spring-catch attached to the guide and having an inward bend or projection forming a shoulder, as specified, whereby the catch is adapted to engage with said collar when the rod is forced down, thus locking the valves in the open position.

4. In a soldering apparatus of the class hereinbefore specified, the combination of the spring-catch having the inward bend or projection forming a shoulder, the valve-rod having a collar which is located between its head and the guide in which the rod works, and is adjustable on said rod, the valves, and air and gas tubes, and a blow-pipe proper with which the latter connect, as shown and described.

5. In a blow-pipe apparatus, the combination, with the bench, the air-tube 1 and gas-tube 2, of the valves E and F, having the respective arms *e f*, of which the latter is longer than the former, the connecting-link *i*, the vertically-sliding rod H, the standard or tubular guide G, supported upon the bench, all as shown and described, whereby when said rod is depressed the air-valve is closed and the gas-valve but partly closed, as specified.

EDWARD B. POWERS.

Witnesses:
THEO. P. HALL,
B. B. PIERCE.